CLAIMS:

1. A method of non-disruptively modifying the routing of lightpaths in an optical mesh network by employing a bridge and roll technique in combination with the use of temporary path protection to change the routing of selected lightpaths.

2. The method as defined in claim 1 wherein the bridge and roll technique is employed with the lightpath in service.

3. The method as defined in claim 2 wherein the selected lightpath is a working lightpath.

4. The method as defined in claim 2 wherein the selected lightpath is a protection lightpath.

5. The method as defined in claim 1 wherein the mesh network operates in a wave division multiplex (WDM) mode.

6. The method as defined in claim 1 wherein the bridge and roll technique is operator directed.

7. The method as defined in claim 1 wherein the routing of the selected lightpath is employed in a single segment, single hop implementation.

8. The method as defined in claim 4 wherein the routing of the selected protection lightpath is employed in a multi-hop, end to end configuration.

9. The method as defined in claim 1 wherein a network management system is employed to implement route modifications.

10. The method as defined in claim 9 wherein the network management system requests a lightpath routing modification.

11. A system for non-disruptively modifying the routing of lightpaths in an optical mesh communication network, the system comprising:

means to implement a bridge and roll protocol wherein temporary paths are employed to change selected lightpaths without having to take the lightpath out of service.

12. The system as defined in claim 11 wherein lambda level switching means at end point nodes coordinate switching of connections from a working path to a protection path.

13. The system as defined in claim 11 wherein a network management system (NMS) implements the bridge and roll protocol.

14. The system as defined in claim 13 wherein the network management system creates single segment protection of a single hop path.

15. The system as defined in claim 13 wherein the network management system employs a multi hop protection scheme to protect a lightpath end to end.

16. A network management system (NMS) for use in an optical mesh communication network to modify, non-disruptively, the routing of a lightpath, the NMS comprising means to implement a bridge and roll protocol in

combination with temporary path protection to change the routing of a selected lightpath while the lightpath remains in-service.

17. The NMS as defined in claim 16 which enables a user to create a protection segment group and a protection branch group.

18. The NMS as defined in claim 16 for creating protection branches and monitoring and switching lightpaths.

19. The NMS as defined in claim 18 for use in 1 x 1 and N x M segment protection.